National Innovation System: Issues for Federal Policy

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"The National Innovation System"

- Production of Knowledge
  - Research and Development
  - Scientists and Engineers
  - Research facilities
  - Other research infrastructure
- Application of Knowledge
  - Problem Solving, New Products, Services, Efficient Processes
  - Gov't, entrepreneurs, business managers, financial institutions

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Fundamental Policy Objectives: Development and Deployment of New Technologies and Applications

- Facilitate competition
- Capture social and economic benefits obtained from new technologies and applications
- Attain national goals, e.g. defense and homeland security, human health, environmental quality
- Ensure availability of systems to meet varied requirements, needs and objectives
- Facilitate adaptation and evolution of society and economy

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Where Federal Policy Can Play an Enabling Role Within the National Innovation System

- Awards and Leadership Groups
- Capital Markets
- Government Data
- Harmonization of Policies
- Intellectual Property
- Partnerships, Antitrust
- Peer Review
- Procurement
- Public-Private Partnerships for Standards
- S&T Priorities
- Talent Pool
- Trade Policy
- Using the Internet

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Questions for Policymakers

1. What current policy mechanisms constitute “best practices” in facilitating innovation?
2. Which mechanisms are “broken” and need to be fixed or eliminated?
3. What new approaches and innovations are needed in policy and programs?
4. Where is new research or knowledge is needed?

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Key Areas for Policy Consideration

- Workforce
- Data and Information
- Coordination/Harmonization
- Intellectual Property
- Market Forces
- Infrastructure and Infratechnologies
- Socioeconomics and Ethics

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Workforce

- Improving education and training
- Strengthening incentives, awards for S&T careers
- Expanding options for access to S&T education

Workforce

- Strengthening the domestic labor market
- Promoting cooperative research (national and international)
- Balancing national security and economic competitiveness in immigration policies for S&T workers

Data and Information

- Facilitating access
- Harmonizing existing data bases
- Improving timeliness and efficiency of collection and dissemination

Data and Information

- Improving relevance of data collected
- Developing new measures and data categories
- Improving public awareness and understanding of the innovation system

Harmonization/Coordination (cont)

- Facilitating partnerships and cooperative research
- Encouraging formation of “clusters” of excellence (regional and international)
- Promoting trade policies that encourage innovation
- Promoting adaptive regulatory regimes

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Harmonization/Coordination (cont)

- Addressing institutional coordination issues
- Improving interagency collaborations
- Improving multidisciplinary collaboration
- Encouraging accountability for R&D spending
- Revising procurement policies

Intellectual Property

- Reforming the patent system
  - Reducing costs of intellectual property protection
  - Improving core competencies of patent examiners
  - Improving efficiency of the process
  - Improving quality of patents
  - Eliminating abuses

Intellectual Property (cont)

- Encouraging harmonization of international intellectual property protections
- Promoting technology transfer

Market Forces

- Strengthening capital markets
- Developing alternative funding mechanisms
- Providing for multi-year federal funding
- Developing fiscal incentives (including tax incentives, procurement policies)
- Establishing national R&D priorities
- Quantifying return on R&D investments

Market Forces (cont.)

- Defining the public versus the private role in R&D
- Promoting technology transfer (through joint ventures, coalitions)
- Working for trade policies that strengthen markets
- Strengthening financial structure of S&T organizations

Infrastructure and Infratechnology

- Developing metrics for priority setting, project selection, performance evaluation
- Developing systems for testing technologies
- Promoting standards development
- Using consensus process for standards
- Improving use of peer review
- Investing in infrastructure R&D

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Socioeconomics and Ethics

- Understanding the conditions for change
- Encouraging entrepreneurial spirit
- Understanding externalities (e.g., opposition to GMOs, labor impacts)
- Removing cultural barriers
- Considering ethical implications of new technologies

Socioeconomics and Ethics (cont)

- Protecting privacy
- Improving security
- Improving economic measures
- Defining public policy goals, via democratic process

Special Considerations

- Smaller government
- Wartime/homeland defense priorities
- Needs if small businesses
- Increasingly diverse missions and motives of universities (education and business)
- Diverse missions of government

Common Themes

- Leadership is needed to define national R&D goals.
  - Shift from short-term to long-term perspective.
  - Diversify investments.
  - Coordinate government programs (past coordination efforts have not worked well).
  - Provide rationale for R&D investments to the public, Congress.

Common Themes

- The “innovation system” is poorly understood.
- International markets need to be understood, more accessible.
- K-12 education needs to be improved to strengthen the domestic labor pool.

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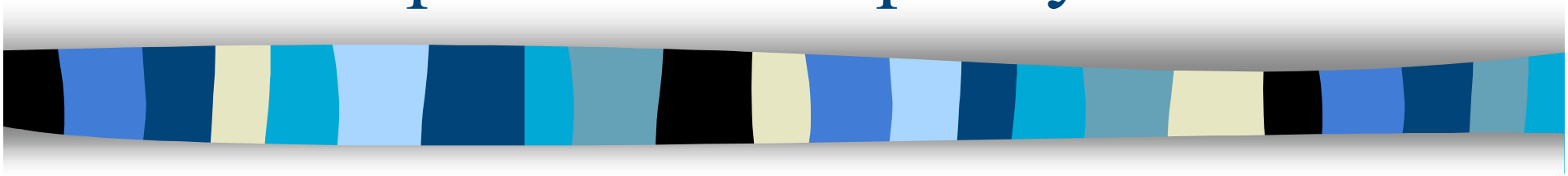
Common Themes

- Barriers to achieving full potential for the Internet need to be removed:
  - organizational and technical inertia
  - interoperability
  - privacy, security
  - access

Common Themes

- The intellectual property system needs to be studied, updated, streamlined.
- Barriers to conducting interdisciplinary research need to be eliminated.
- More refined policies on data access and security are needed.

Slides for Developing Entrepreneurial Capacity



Policy Considerations

- Shared Risks and Rewards
  - Education, communication, transportation infrastructure
  - Bankruptcy laws
  - Availability of favorable tax treatment
  - Culture that celebrates entrepreneur success & accepts entrepreneur "failure"
- Fostering and Protecting Innovation
  - Intellectual Property Laws
  - Investment in R&D and tech transfer

Policy Considerations (cont)

- Expertise
  - Investments in education & training
  - Regional policy to support networks of suppliers
- Planning and Strategy
  - Reduced regulatory burdens
  - Flexibility and adaptiveness in instruments/conditions for capital and labor

Policy Considerations (cont)

- Capital
  - Availability of non-institutional equity capital (credit cards, second mortgages)
  - Incentives to re-invest earnings
  - Securities regulations
  - Availability of seed capital and angel networks
  - Fostering venture capital investment
    - securities regulation, accounting standards, and initial public offering market regulations
    - anti-trust policy favoring venture-backed companies